

## **Production of a bioadsorbent from oil palm kernel shell, and application for pollutants and colour removal in palm oil mill effluent final discharge**

### **ABSTRACT**

In an effort to mitigate the palm oil mill effluent (POME) final discharge to the river water, palm kernel shell activated carbon has been identified as a promising adsorption technique for enhanced removal of pollutants (Biological Oxygen Demand, Chemical Oxygen Demand, Total Suspended Solid) and colour from the wastewater treatment plant. The bioadsorbent was prepared by carbonize at 400°C using two-in-one carbonization and activation system and further steam activate at 900°C with a total process time of 7 hours. The adsorption capacity was evaluated at different bioadsorbent dosage, treatment time, and initial concentration of pollutants and colour. The bioadsorbent showed the maximum removal of pollutants with a bioadsorbent dosage of 40 g/L at treatment time of 12 hours. Scanning electron microscopy revealed that the treatment image of bioadsorbent was filled with impurities and elements of POME final discharge. This demonstrated that palm kernel shell activated carbon is a potential bioadsorbent for pollutants and colour removal in POME final discharge.